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SOUTHWEST FISHERIES CENTER

MONTHLY REPORT - JANUARY 1984
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NOAA/NMFS

SOUTHWEST FISHERIES CENTER

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SOUTHWEST FISHERIES CENTER
LA JOLLA, CALIFORNIA

HONOLULU LABORATORY
LA JOLLA JABORATORY
TIBURON LABORATORY
PACIFIC ENVIRONMENTAL GROUP

MONTHLY REPORT - JANUARY 1984

STATUS OF PUBLICATIONS

Published

Dotson, Ronald C. and John E. Graves. 1984. Biochemical identification of a bluefin tuna establishes a new California size record. California Fish and Game 70(1):62-64.

Reilly, Stephen B., Dale W. Rice and Allen A. Wolman. 1983. Population assessment of the gray whale, Eschrichtius robustus, from California shore censuses, 1967-80. Fish. Bull., U.S. 81(2):267-281.

Estimates of abundance by year were developed for the California-Chukotski stock of gray whales from a 13-year consecutive series of shore censuses, conducted near Monterey, California. Annual estimates of population size range from a low of 10,414 for 1971-72 to a high of 17,577 for 1979-80. Standard errors are about 10% of population estimates. During the 13 years, the population increased annually by 2.5%, and a 1.2% harvest in the Soviet subsistence fishery was recorded, indicating a 3.7% net annual productivity.

Seasonal migratory timing was relatively constant during the study period. Gamma probability density function models of the annual migrations past Monterey had an overall mean day of 9 January, with a range from 8 to 19 January. A slight depression in mean hourly count for 0700-0800 h, during 1978-79 and 1979-80, contrasted with a constant mean hourly count through 10 daylight hours during the previous 11 years. Aerial surveys of the offshore distribution of southward migrating whales during 1979-80 agreed closely with those reported for 1978-79, indicating that 40% pass within 1 mile (1.6 km) of shore and 90% within 2 miles

THIS REPORT DOES NOT CONSTITUTE PUBLICATION AND IS FOR INFORMATION ONLY.

(3.2 km). In the shore censuses, about 20% of the passing whales were missed due to their distance offshore.

Kato, Sus. 1983. An overview of California squid fisheries and the the California light fishery. In Proceedings of the West Coast Squid Symposium, February 1-2, 1983, Newport, Oregon. West Coast Fisheries Development Foundation and Oregon State University Sea Grant.

Kuz'min, A.A. and W.F. Perrin. 1983. The main features of the skull formation in dolphins (Cetacea) during the prenatal period. Zoological Journal 62:102-112.

Data are provided on skull formation in the killer whale, common dolphin, spotted dolphin and long-snout dolphin during the prenatal period. A marked similarity in the skull development of these species serves as additional evidence of the earlier suggestion on monophyletic origin of toothed whales. The formation of skull vault bones in dolphins and sperm whale is subject to individual and interspecific variation and is similar to that in the Theromorpha. The origin and formation of the mentomeckelian bone is first described in detail for the toothed whales. The problem of homologization of the skull vault bones in the toothed whales is also discussed.

Approved by Center Director

Ahlstrom, E.H., I. Amaoka, D.A. Hensley, H.G. Moser and B.Y. Sumida. Ontogeny and systematics of fishes Pleuronectiformes (I). For consideration for publication in Ahlstrom Symposium Book.

Ankenbrandt, Lisa. The occurrence of young skipjack tuna (Katsuwonus pelamis) in the diet of adult skipjack from the southwestern Atlantic Ocean. For publication in ICCAT Book.

Fiedler, Paul C. Effects of El Niño 1983 on the northern anchovy. For consideration for publication in CalCOFI Reports.

Hobson, Edmund S., and James R. Chess. The influence of trophic relationships on species composition in a nearshore marine fish community off Southern California. For consideration for publication in Fishery Bulletin.

Johnston, Ian A., and R. Brill. Thermal dependence of contractile properties of single-skinned muscle fibers from Antarctic and various Pacific marine fishes including skipjack tuna (Katsuwonus pelamis) and kawakawa (Euthynnus affinis). J. Comp. Physiol.

Perry, S.F., C. Daxboeck, R.W. Brill, P.W. Hochachka, and B. Emmett. In vitro and in vivo acid-base regulation in the skipjack tuna (Katsuwonus pelamis): Effects of temperature change and exhausting exercise. Respir. Physiol.

Polovina, Jeffrey J., and Mark D. Ow. An approach to estimating an ecosystem box model. Fish. Bull., U.S. (Note).

Polovina, Jeffrey J. and Richard S. Shomura. An experimental design to estimate yield enhancement for bottom fishes resulting from the use of bottom shelters on banks in the Pacific. Bull. Mar. Sci.

Sakagawa, Gary T. Skipjack fisheries in the western Atlantic. For publication in ICCAT Book.

Administrative Reports

Skillman, Robert A., Daniel R. Locey, and James C. Cooper. 1984. Cross tabulations of catches of large pelagic species based on Hawaii commercial catch reports, January 1976-April 1981. I. Area fished and fishing gear by species. SWFC Admin. Rep. H-84-1.

Skillman, Robert A., and James C. Cooper. 1984. Cross tabulations of catches of large pelagic species based on Hawaii commercial catch reports, January 1976-April 1981. II. Species by area fished and fishing gear. SWFC Admin. Rep. H-84-2.

HONOLULU LABORATORY

INSULAR RESOURCES INVESTIGATION

Intensive Shrimp Fishing Conducted in Mariana Archipelago

Dr. Jeffrey J. Polovina, Leader, Resource Assessment Investigation of the Mariana Archipelago (RAIOMA), reports that field work in the Marianas has provided the first estimate of biomass of exploitable deepwater shrimp, Heterocarpus laevigatus. Dr. Stephen Ralston, Chief Scientist, on the second FY 1984 RAIOMA cruise on the NOAA Ship Townsend Cromwell spent 15 days of intensive shrimp trapping totaling 300 trap-nights of effort on an isolated 1 nmi^2 area in depths of 545-727 m (300-400 fathoms) north of Alamagan Island in the Marianas. During the period of intensive fishing a statistically significant decline in catch rate from 3.4 kg/trap-night to 1.8 kg/trap-night was documented. A regression of catch rate on cumulative catch (Leslie's method) produced an estimate of 1,700 kg/nmi^2 of exploitable shrimp biomass at the start of intensive trapping. With this estimate of biomass, the estimate of catchability also obtained from intensive fishing, data on the systematic mapping of catch rates for deepwater shrimp, and bathymetric surveys which measure the total shrimp habitat, it will be possible to estimate the total standing stock of this shrimp in the Mariana Archipelago.

Revised Draft of Fishery Atlas Ready for Internal Review

Richard N. Uchida, Leader, Insular Ecosystem Program, and fishery biologist James H. Uchiyama, editors of the "Fishery atlas of the Northwestern Hawaiian Islands," report that the revised draft of the manuscript is ready for internal review. The atlas includes species accounts of 6 crustaceans, 1 mollusc, and 31 fishes. In addition to Uchida and Uchiyama, contributing authors include research assistants Alan R. Everson, Victor A. Honda, Robert L. Humphreys, Jr., Steven H. Kramer, and Michael P. Seki, and fishery biologist Paul M. Shiota. Research assistant Darryl T. Tagami provided programming assistance to produce tables for the atlas including summaries of scientific and common names, species distribution by geographic area and depth of capture, size range of species caught, and catch by type of gear used in the sampling.

Hard Parts of Pelagic Armorheads Examined for Annual Marks

Under the direction of James Uchiyama, research assistant Jeffrey D. Sampaga began a detailed examination of the hard parts of the pelagic armorhead, Pentaceros richardsoni, for annuli. Polished sections of dorsal, anal, and pelvic spines of pelagic armorhead all had marks that resemble annuli. The centrum of vertebrae selected randomly from the vertebral column and the hypural plate also had annuli. All counts obtained from hard parts listed above agreed with age estimate obtained from the sagitta. The scales, opercle, and subopercle did not have any marks.

Morphometric and Meristic Study of Pelagic Armorheads Continue

Research assistant Robert R. Humphreys is continuing a morphometric and meristic study of fat and lean types of pelagic armorheads. In the course of his study, Humphreys noticed an absence of gill parasites among the fat type and a frequent occurrence of parasites among the lean and intermediate types. He believes that these parasites could be used as biological indicators; samples of the parasites have been sent to specialists for identification.

In a related study, Dr. Fred Utter and Gary Winams of the Northwest and Alaska Fisheries Center, Seattle, are continuing electrophoretic work on pelagic armorheads. A detailed report on the results is expected when their work is completed.

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Richard Uchida reports that the final agenda for the Shimizu seamount workshop has been drafted and will shortly be mailed to participants.

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Michael Seki continued work on a paper describing the bottom handline and longline fishery for alfonsin, Beryx sp. He also revised a draft manuscript on trophic relationships of tropical seabirds.

* * * * * * * * * *

Robert Humphreys completed drafting the narrative report for the cruise to the southern Emperor-northern Hawaiian Ridge seamounts (TC-83-02). He also gave a slide presentation of the cruise results at the meeting of the Scientific and Statistical Committee (SSC), Western Pacific Regional Fishery Management Council (Council), at the Ala Moana Banquet Hall.

Deepwater Shrimp Proposal Prepared

Reginald M. Gooding, Fishery Biologist, prepared a project proposal, "Observations to determine factors responsible for catch-rate variation between traps and behavioral characteristics of the deepwater shrimp, Heterocarpus ensifer, relative to trap design," which will be submitted to the Hawaii Undersea Research Laboratory science program directors. The project will be undertaken by Gooding, Dr. Jeffrey Polovina, and Robert B. Moffitt, Fishery Biologist of the Honolulu Laboratory, in collaboration with Dr. Murray D. Dailey, Director of Research and Development of the Hawaiian Fishery Research Co. Dr. Dailey is particularly interested in collecting shrimp and

substrate samples directly from the bottom. The samples will be used in a study of several Vebrio species of bacteria. The bacteria appear to be associated with a deterioration of shrimp muscle which limits the marketability of the product.

* * * * * * * * * *

On the basis of the outside review, Gooding made a final revision of the manuscript, "Trapping surveys for deepwater shrimps, Heterocarpus laevigatus and H. ensifer in the Northwestern Hawaiian Islands."

PELAGIC RESOURCE INVESTIGATION

Manuscript Describes Uses of Ultrasonic Telemetry to Determine Tuna Movements around FADs

Dr. Richard W. Brill, Leader, Experimental Ecology of Tunas Program, reports that he, Dr. Kim N. Holland, Hawaii Institute of Marine Biology, University of Hawaii, and Lt. (jg) J. Scott Ferguson, NOAA Corps, have been working on a manuscript, "Use of ultrasonic telemetry to determine the short-term movements and residence times of tunas around fish aggregating devices," for presentation at the Pacific Congress on Marine Technology. The manuscript describes the tracking vessel, the ultrasonic telemetry, and computerized data analysis systems used for the tracking project. Analysis of data on the horizontal and vertical movements of four tunas that were recently tracked is included in the manuscript.

New Spawning Pairs of Mahimahi Established

Dr. Brill reports that several new spawning pairs of mahimahi, Coryphaena hipprus, have again been established at the Kewalo Research Facility. The mahimahi are spawning approximately every other day, and fertilized eggs are being shared with the Waikiki Aquarium and the Center for Marine Biotechnology (Harbor Branch Institute, Fort Pierce, Florida).

The resulting mahimahi larvae are being used by Thomas S. Kazama, Fishery Biologist, for experiments on the effects of diet (three algae species are being tested) on the survival and growth of the larvae. Andrew Ayers, University of Hawaii graduate student, has also begun a project to analyze the proximate composition, caloric value, and unsaturated free fatty acid composition of the three algae species. Data from this analysis will be compared with those on the effects each alga species has on the survival and growth of mahimahi larvae.

LA JOLLA LABORATORY

Coastal Fisheries Resources Division

COASTAL EASTERN PACIFIC FISHERIES ENVIRONMENTAL INVESTIGATIONS

Manual on the Egg Production Method for Biomass Estimation in Preparation

Scientists throughout the world have expressed interest in using the egg production method of biomass assessment developed at the Southwest Fisheries Center in La Jolla. Because many of the details of this technique are not published, scientists at the La Jolla Laboratory's Coastal Division have been compiling a manual intended as an up-to-date account of the method. The following papers have been submitted for this manual, edited by Dr. Reuben Lasker, Leader of the Coastal Division.

Dr. Roger Hewitt: Sampling requirements for an adult anchovy survey. Dr. Roger Hewitt: The CalCOFI vertical egg tow (CalVET). Drs. H. Geoffrey Moser and E.H. Ahlstrom: Anchovy egg staging. Dr. J.R. Hunter, Dr. N. Lo, and Mr. R.J.H. Leong: Anchovy batch fecundity. Dr. Nancy Lo: A temperature-dependent anchovy egg developmental model. Dr. P.E. Smith: Biology of the northern anchovy: 1) spawning area, season, and depth range; 2) catchability and vulnerability of adult.

Sampling requirements for an egg survey: 1) Principles of net and net tow design and 2) criteria for the number of egg stages. Dr. Gary Stauffer: Sorting, staging, and ageing methods for anchovy eggs. Dr. J.R. Hunter and Ms. B.J. Macewicz: Estimation of anchovy spawning frequency.

SWFC Scientist Invited to Participate in FAO Project in Azores

At the request of FAO, Rome, Italy, Ron Dotson, Fishery Biologist, traveled to the Azores, and Rome, Italy, January 8-22, 1984, to design plans for a proposal to conduct alternative tuna fishing methods in the Azores as an FAO project. He spent 5 days in the Azores, escorted by Dr. Adolfo Lima, Regional Secretary of Agriculture and Fisheries, where he interviewed local fishery scientists and fishermen and examined vessels and facilities. Discussions included the availability of tuna and bait during winter, oceanographic and weather conditions and fishing gear. Scientists at the Universidad dos Azores agreed that they would attempt to conduct bathythermograph sections in prime fishing areas prior to the proposed fishing experiments.

Following the Azores visit Dotson traveled to Rome to work out the details for completing a proposal with John Simpson and Bjorn Bjornason of the FAO. The summary report of his survey visit and the proposed project plan were submitted to FAO. The following, excerpted from the project proposal, provides the background and justification:

The Azores tuna fisheries and canning industry has suffered for years from a lack of a year-round supply resources due to a lack of skilled fishermen and adequate technology. The traditional tuna fishery operates from April through late September, when surface fishing success decreases and most of the work force is required to harvest the crops. The technology dominating the Azores tuna operations is pole and line bait fishing. Although the bait resource availability controls, to some degree, the seasonality of the pole and line fishery, changes in oceanographic conditions which reduce the availability of the tunas at the surface and subsequent decreased catches is the primary seasonal control. The Azorean tuna fishery is terminated when the catches for a vessel with a crew of 17 men drop below approximately 1 ton per day. This is coincident with the seasonal deepening of the thermocline in the autumn.

Recent developments in the North Pacific tuna fisheries for albacore and bigeye might be used to extend Azorean tuna fishing operations through much of the rest of the year. Over the past 3 years studies of a modified longline gear combined with fishing area and gear deployment strategies have shown that tuna may be caught effectively in times and areas where surface fishing success is minimal. The modified longline gear requires only 3-4 men to operate efficiently, is designed for vessels of 15-25 m, and is quite competitive when compared to Asian longlining methods which employ 18-25 crew members.

Behavior studies of several species of Thunnus, using ultrasonic tags to map depth distribution and horizontal movement, have shown that these species tend to aggregate around the thermocline and spend little time in surface waters. This is particularly true in the mid-ocean environment when the top of the thermocline is greater than 50 m in depth. By measuring the depth of the thermocline and effectively placing the fishing gear within that zone it is possible to increase longline catches dramatically. Recent tests have also indicated that catches can be further increased by using all monofilament gear rather than the more typical nylon or poly lines.

Using the gear and strategy described above it should be possible to effectively fish for tunas around Azores from autumn to spring. The vessels presently used in the surface fishery are adequately fitted and seaworthy and require only minor modifications to deploy longline gear and employ recent fishing area location techniques. The capability of using fewer crewmen would reduce the number of fish required to make a trip profitable, with catches of 1 ton per day considered sufficient. The probable addition of billfish to the longline catch would also open markets for a new product, with probable sales to mainland countries where these fish command high prices. In addition to longlining, trolling gear will be utilized during running time to supplement longline catches.

The findings from ultrasonic-tagged tuna, experimental albacore longlining, and longline gear development were all derived from past and recent research projects of the Coastal Eastern Pacific Fisheries Environmental Investigations at the La Jolla Laboratory.

COASTAL EASTERN PACIFIC POPULATION BIOLOGY OF FISHES

Feeding and Growth Examined in Larval Anchovy

This month fishery biologist Gail Theilacker and NOAA Jr. Fellow Amy Kimball analyzed data Theilacker collected from a series of experiments examining feeding and growth in larval northern anchovy. Theilacker's objective is to determine how variations in prey type and density affect larval fish feeding rates, consumption, growth, gross growth efficiencies, and assimilation.

Four groups of anchovy larvae were fed a different diet -- rotifers and copepods, each at two prey levels. Rotifer densities were maintained in the rearing containers at 2/ml and 25/ml for 16 days. Estimates of growth and consumption by anchovy fed on the rotifer diets were completed this month.

To determine gross efficiencies, information is needed on growth (increase in standard length and fresh dry weight), gut contents over time, and evacuation rates. An analysis of covariance was used to test for diet-induced differences in length and weight relationships; all data except age were transformed to natural logs. There were no length ($p=.15$) or weight ($P=.45$) differences at age between the two rotifer treatments.

Gut contents was determined by sampling fish throughout the 12-hour feeding day and counting and measuring the prey in their stomachs. Because anchovy eat continuously, asymptotic curves ($c=Cmax(1-e^{-kt})$ were used to describe food intake, i.e., the relation between observed gut contents c, at time t, where Cmax is the asymptotic gut contents and k is the slope (instantaneous rate of gut filling). Using Marquardt's algorithm for fitting nonlinear models, parameters Cmax and k were estimated for 0.5 mm length classes. Daily mean gut contents was calculated by integrating the area beneath the curves and dividing by the 12-hour feeding period. With the assistance of mathematician, Nancy Lo, general equations were derived for both diets which allow the calculation of gut contents at time t for all fish lengths between 4-8 mm.

Gut clearance times of actively feeding larvae appear to be independent of age, but may depend on prey density. The average time needed to clear the guts of anchovy feeding on 25 rotifers/ml was 1.15 hours (range 0.92-1.58 hrs; n=7). At the lower rotifer density, evacuation could not be precisely determined, but times were longer than 1 hour and less than 2 hours.

To estimate assimilation efficiency, they simply combined the energy of metabolism and growth and divided it by the energy consumed. Width-specific

caloric values for rotifers were previously determined by Theilacker and Kimball; Theilacker has earlier reported the information on metabolism of anchovy larvae.

Gross growth efficiencies and assimilation efficiencies were calculated for both diets using 1) evacuation times of 1.15 h for the high density diet and assuming 1.5 h for the low density diet, 2) daily food consumption estimated with the general equations, 3) age-length and age-weight data for each diet, and 4) weight-specific metabolic rates. Comparative data are given for several days in the table below. Preliminary results indicate that gross growth efficiencies and assimilation efficiencies increase with decreasing prey densities. This information has significant implications when applied to field conditions.

Effect of rotifer diets on growth and assimilation efficiencies.

Age days	Length mm		Weight µg		Consumption µg		Gross growth efficiency*		Assimilation efficiency %	
	I	II	I	II	I	II	I	II	I	II
5	4.13	4.03	17.41	18.77	14.14	9.87	.26	.29	50	62
7	4.66	4.46	25.50	24.93	21.14	11.33	.25	.32	48	68
9	5.22	4.92	37.17	32.82	26.97	13.16	.29	.39	51	79
11	5.92	5.44	54.33	43.48	33.82	15.62	.34	.42	59	86

I = rotifers fed at 25/ml
II = rotifers fed at 2/ml
* Δ fish weight/food weight

COMMERCIAL AND RECREATIONAL FISHERIES RESEARCH FOR MANAGEMENT

Manuscripts Completed on Travel-cost Demand Models

During the month of January economist Cindy Thomson completed work on the travel-cost analysis of recreational partyboat fishing in California, which will be distributed as an Administrative Report co-authored by Huppert and Thomson. The report addresses several econometric issues as well as providing a numerical valuation of the fishery. Conclusions are as follows:

In the traditional distance zone approach to travel-cost analysis, data are aggregated with respect to a single variable (e.g., travel distance), thereby reducing variation in other unrelated variables (e.g., income) and obscuring their impact on recreational participation rates. On the other hand, parameter estimates based on disaggregated data are likely to be biased and inconsistent, due to the presence of measurement error in such data. Defining zones of residence as compact clusters of zipcode areas (as we have done) tends to preserve variation in distance and other independent variables, while reducing measurement error relative to its presence in disaggregated data.

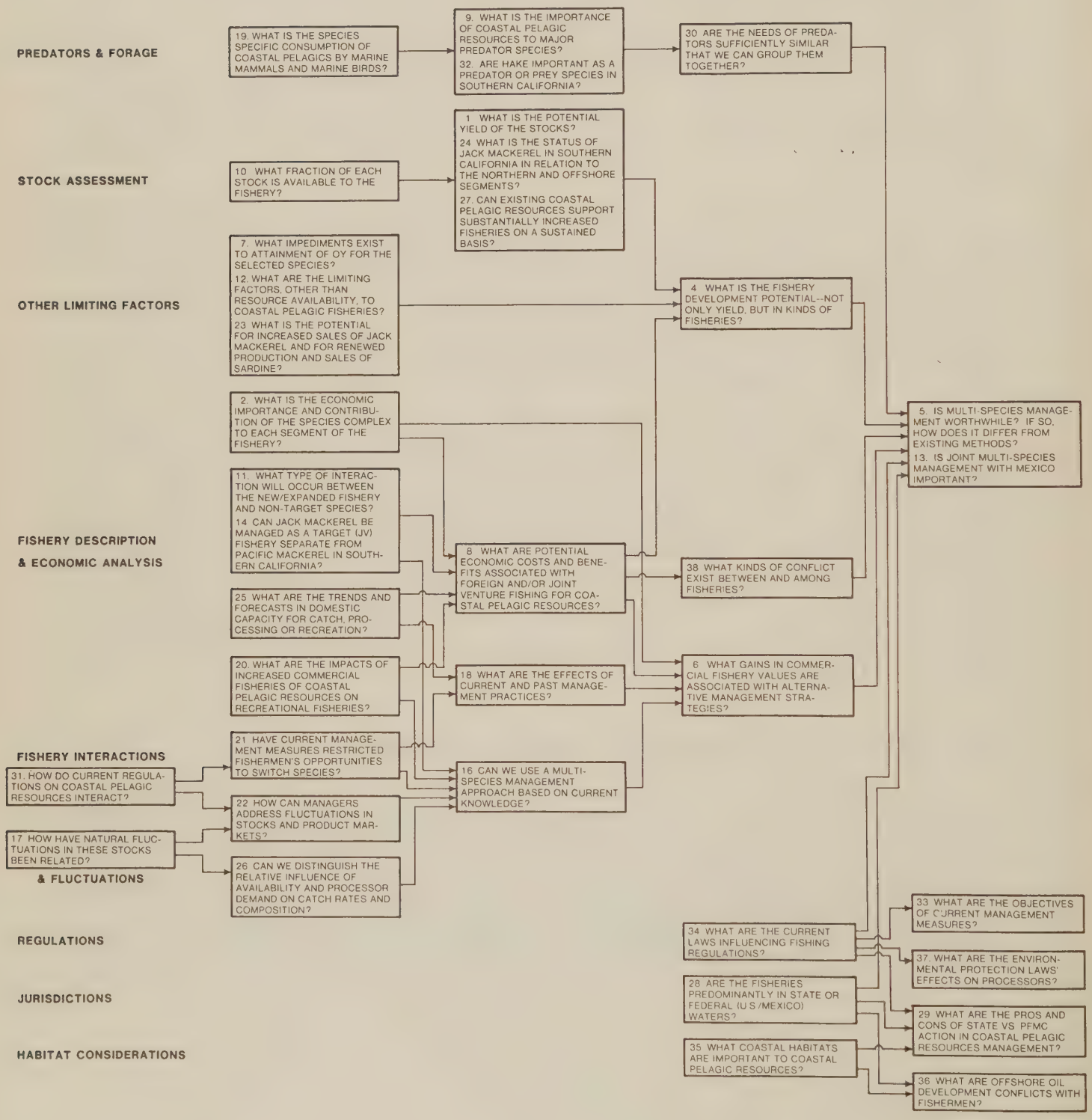
Using sampling theory, we derived expressions for the variance of the dependent variable in linear and semilog participation rate equations. We found that the variance depends on a) zonal population and b) the number of anglers sampled from the zone in the linear case; in the semi-log case it depends only on the number of anglers sampled from the zone. Our results suggest that weighting observations by the square root of zonal population, as suggested in some of the travel-cost literature, may be an inadequate way to correct for heteroskedasticity in zonal average data.

Using angler survey data collected in 1979-80 and correcting for heteroskedasticity (where appropriate), we applied the travel cost method to seven different fishing areas in California. We found consumer surplus/trip to be higher in those areas (San Diego, Morro Bay and San Francisco) where highly prized gamefish (salmon and/or albacore) are seasonally available. We estimated statewide aggregate consumer surplus (net economic benefit) attributable to this recreational activity to be over $8 million. Adding this figure to the $52 million in partyboat-related purchases made in 1979 yields a gross economic benefit of over $60 million. Changes in benefits from year to year are likely to occur, due to changes in prices and in the number of passenger trips made.

Outline Completed for Management Information Document

Dr. Alec MacCall, Fishery Biologist, completed an outline for producing a management information document (MID) for southern California coastal pelagic fishes (anchovy, sardine, Pacific mackerel, jack mackerel, bonito and squid). The outline is based on the results of an earlier meeting which used the Nominal Group Technique to develop a list of issues to be addressed in the MID. Interrelationships among those issues were addressed by means of Interpretive Structural Modeling, and the resulting network of issues (attached) provides a framework on which the ID is being designed.

SOUTHERN CALIFORNIA PELAGIC MULTI-SPECIES ISSUES


PREDATORS & FORAGE
19. WHAT IS THE SPECIES SPECIFIC CONSUMPTION OF COASTAL PELAGICS BY MARINE MAMMALS AND MARINE BIRDS?
9. WHAT IS THE IMPORTANCE OF COASTAL PELAGIC RESOURCES TO MAJOR PREDATOR SPECIES?
32. ARE HAKE IMPORTANT AS A PREDATOR OR PREY SPECIES IN SOUTHERN CALIFORNIA?
30. ARE THE NEEDS OF PREDATORS SUFFICIENTLY SIMILAR THAT WE CAN GROUP THEM TOGETHER?
STOCK ASSESSMENT
10. WHAT FRACTION OF EACH STOCK IS AVAILABLE TO THE FISHERY?
1. WHAT IS THE POTENTIAL YIELD OF THE STOCKS?
24. WHAT IS THE STATUS OF JACK MACKEREL IN SOUTHERN CALIFORNIA IN RELATION TO THE NORTHERN AND OFFSHORE SEGMENTS?
27. CAN EXISTING COASTAL PELAGIC RESOURCES SUPPORT SUBSTANTIALLY INCREASED FISHERIES ON A SUSTAINED BASIS?
OTHER LIMITING FACTORS
7. WHAT IMPEDIMENTS EXIST TO ATTAINMENT OF OY FOR THE SELECTED SPECIES?
12. WHAT ARE THE LIMITING FACTORS, OTHER THAN RESOURCE AVAILABILITY, TO COASTAL PELAGIC FISHERIES?
23. WHAT IS THE POTENTIAL FOR INCREASED SALES OF JACK MACKEREL AND FOR RENEWED PRODUCTION AND SALES OF SARDINE?
4. WHAT IS THE FISHERY DEVELOPMENT POTENTIAL--NOT ONLY YIELD, BUT IN KINDS OF FISHERIES?
2. WHAT IS THE ECONOMIC IMPORTANCE AND CONTRIBUTION OF THE SPECIES COMPLEX TO EACH SEGMENT OF THE FISHERY?
5. IS MULTI-SPECIES MANAGEMENT WORTHWHILE? IF SO, HOW DOES IT DIFFER FROM EXISTING METHODS?
13. IS JOINT MULTI-SPECIES MANAGEMENT WITH MEXICO IMPORTANT?
FISHERY DESCRIPTION & ECONOMIC ANALYSIS
11. WHAT TYPE OF INTERACTION WILL OCCUR BETWEEN THE NEW/EXPANDED FISHERY AND NON-TARGET SPECIES?
14. CAN JACK MACKEREL BE MANAGED AS A TARGET (JV) FISHERY SEPARATE FROM PACIFIC MACKEREL IN SOUTHERN CALIFORNIA?
8. WHAT ARE POTENTIAL ECONOMIC COSTS AND BENEFITS ASSOCIATED WITH FOREIGN AND/OR JOINT VENTURE FISHING FOR COASTAL PELAGIC RESOURCES?
38. WHAT KINDS OF CONFLICT EXIST BETWEEN AND AMONG FISHERIES?
25. WHAT ARE THE TRENDS AND FORECASTS IN DOMESTIC CAPACITY FOR CATCH, PROCESSING OR RECREATION?
20. WHAT ARE THE IMPACTS OF INCREASED COMMERCIAL FISHERIES OF COASTAL PELAGIC RESOURCES ON RECREATIONAL FISHERIES?
18. WHAT ARE THE EFFECTS OF CURRENT AND PAST MANAGEMENT PRACTICES?
6. WHAT GAINS IN COMMERCIAL FISHERY VALUES ARE ASSOCIATED WITH ALTERNATIVE MANAGEMENT STRATEGIES?
FISHERY INTERACTIONS
31. HOW DO CURRENT REGULATIONS ON COASTAL PELAGIC RESOURCES INTERACT?
21. HAVE CURRENT MANAGEMENT MEASURES RESTRICTED FISHERMEN'S OPPORTUNITIES TO SWITCH SPECIES?
16. CAN WE USE A MULTI-SPECIES MANAGEMENT APPROACH BASED ON CURRENT KNOWLEDGE?
22. HOW CAN MANAGERS ADDRESS FLUCTUATIONS IN STOCKS AND PRODUCT MARKETS?
17. HOW HAVE NATURAL FLUCTUATIONS IN THESE STOCKS BEEN RELATED?
26. CAN WE DISTINGUISH THE RELATIVE INFLUENCE OF AVAILABILITY AND PROCESSOR DEMAND ON CATCH RATES AND COMPOSITION?
& FLUCTUATIONS
REGULATIONS
34. WHAT ARE THE CURRENT LAWS INFLUENCING FISHING REGULATIONS?
33. WHAT ARE THE OBJECTIVES OF CURRENT MANAGEMENT MEASURES?
37. WHAT ARE THE ENVIRONMENTAL PROTECTION LAWS' EFFECTS ON PROCESSORS?
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28. ARE THE FISHERIES PREDOMINANTLY IN STATE OR FEDERAL (U.S./MEXICO) WATERS?
29. WHAT ARE THE PROS AND CONS OF STATE VS. PFMC ACTION IN COASTAL PELAGIC RESOURCES MANAGEMENT?
HABITAT CONSIDERATIONS
35. WHAT COASTAL HABITATS ARE IMPORTANT TO COASTAL PELAGIC RESOURCES?
36. WHAT ARE OFFSHORE OIL DEVELOPMENT CONFLICTS WITH FISHERMEN?

Lecture Presented on Stock Concept in Fishery Management

Dr. Alec MacCall was an invited speaker at a "California Sea Grant Workshop on Identifying Fish Subpopulation" held at Scripps Institution of Oceanography on January 27, 1984. Dr. MacCall, who spoke on the stock concept in fishery management, emphasized that practical definition of a fishery stock may be different from definition of a genetic subpopulation.

Dr. MacCall explained that the definition of a stock depends on what is tobe done with the stock and what is known about it. These interacting operational and informational considerations are well balanced in Larkin's definition [with some modifications] of a stock as, "a population of organisms which [ideally] sharing a common gene pool, is sufficiently discrete [and nominally identifiable] to warrant consideration as a self-perpetuating system which can be managed." When information is insufficient or operational considerations are paramount, biologically inappropriate but nonetheless functional definitions may result (e.g., Gulf of Thailand multispecies trawl fishery, Ecuadorian tuna fishery). In the case of salmonids, genetic considerations may be most important.

All fishery management is implicitly based on the concept of a stock, be it no more than the entity from which harvests are taken (mark-recapture and virtual population estimates of abundance usually contain such an implicit definition of stock). Management of California's coastal pelagic fishes utilizes nominal fixed geographic boundaries which have been based on genetic (anchovy, sardine) and tagging (Pacific mackerel) studies. Fixed boundaries are operationally useful for conducting fishery-independent surveys of stock abundance as in the case of acoustic or egg and larva surveys. However there remain problems with geographic shifts of stock distribution due to seasonal or oceanic fluctuations. Also, stocks may not be discrete, but rather be continuous in their structure or genetic variability. Future genetic investigations may help to resolve these problems.

Relationships Examined Between Environmental Variation and Recruitment of Anchovy

Dr. Richard Methot, Fishery Biologist, recently has examined the relationship between environmental variation and recruitment of anchovy. The recruitment information includes classic assessments of year-class strength and birthdate distributions of juveniles.

The birthdate distribution of juveniles--the survivors of the larval stage--indicates periods during which conditions were suitable for larval survival. The birthdate distributions of five year-classes of Engraulis mordax have been determined by analyzing daily increments in the otoliths of juveniles collected about 8 months after the major spawning season. This work has been conducted by fishery biologist John Butler with assistance from laboratory assistant Susan Longinotti. With these data, the researchers can pose two important questions: 1) Are year-classes, particularly good year-classes, dominated by individuals born during a brief period? In the 5 years

The magnitude of the bias was related to the maximum rate of population change and the type of density dependence. At a maximum growth rate of 8%, the largest bias in the population growth rate was 3% points. Bias was greatest when pre-weaning pup mortality was density dependent.

The results of this study will be used to help evaluate whether or not estimates of the replacement rate are conservative. Currently, the replacement rate is assumed to equal the rate of population change. One of the primary reasons for conducting this study was the unexpected magnitude of population growth for several species of pinniped (in some cases in excess of 10% per year). It is the author's conclusion that for those species where pup survival is density dependent, estimates of population growth are too high, and therefore estimates of the replacement rate will not be conservative. This potential source of bias should be considered in evaluating series of pup counts. A manuscript embodying these findings is currently being reviewed, and will be submitted for consideration for publication to the U.S. Fishery Bulletin in the near future.

Age Structured Model Developed to Handle Variation in Age-Specific Reproductive Intervals

A workshop in Vancouver, B.C., was held February 1-3, 1984, to develop a population model for polar bears that could handle the following inputs: age specific birth and death rates, age and sex specific harvest rates, a variable reproductive interval that was sensitive to cub mortality, absolute estimates of the age structure and population size. Dr. Douglas DeMaster, Leader of the Coastal Marine Mammal Project, participated in this workshop, which was the final workshop in a series of three. All participants seemed satisfied that the model had correctly reconstructed the population dynamics that were specified. DeMaster, who will be working with a copy of the model in La Jolla, believes it will have a great deal of applicability to any species with extended periods of maternal care. He intends to modify the program so it can be used on the La Jolla Standard micros at the SWFC.

MULTISPECIES DATA MANAGEMENT AND FISHERY MONITORING

Status of Atlantic Tuna Fishery Sampling Program

Foreign-caught Atlantic tunas transshipped to Puerto Rico are sampled routinely for biological information by biological technician Eugene Holzapfel. Data on fork length, weight, and species composition of catches are collected. Of the 117 samples taken in 1983, 100 are from the eastern Atlantic (off the coast of Africa) and 17 are from the western Atlantic. Results of Holzapfel's sampling during 1983 are as follows:

Species and gear	# of samples	# of fish sampled	Tonnage sampled (MT)
Yellowfin			
Purse seine	19	1312	604.4
Baitboat	26	2035	401.6
Longline	1	71	1.1
Unknown	14	1071	188.7
Skipjack			
Purse seine	9	456	2641.4
Baitboat	15	755	1533.7
Unknown	2	101	117.0
Bigeye			
Purse seine	14	444	290.2
Baitboat	2	69	1.0
Unknown	7	193	52.6
Albacore			
Longline	2	100	1262.6
Unknown	3	150	938.2
Blackfin			
Baitboat	2	100	13.3
Bullet tuna			
Purse seine	1	50	180.3

During the period from January 1 to December 31, 1983, 26 size composition samples were collected for the Multispecies Data Management and Fisheries Monitoring Program by the Inter-American Tropical Tuna Commission. These data were collected from seven foreign purse seiners that fished in the Caribbean Sea and transshipped their catches to Puerto Rico. A summary of these data follows:

Species	Trips sampled	# of samples	# of fish sampled
Yellowfin	7	10	500
Skipjack	7	9	452
Blackfin	4	4	119
Bigeye	2	2	6
Albacore	1	1	18

PACIFIC ENVIRONMENTAL GROUP

OCEAN CLIMATOLOGY AND MONITORING

Oceanographic Data Assembled to Track Effects of Recent El Niño

Dr. Douglas McLain is assembling available oceanographic data to track the effects of the recent El Niño conditions. Using some 140,000 ocean temperature profiles of the waters along the west coast of North and South America, data that came from the archives of Fleet Numerical Oceanography Center, Dr. McLain has developed time series of fluctuations of the depth of subsurface isotherms with distance along the coast. He has worked with the 14°C isotherm because this isotherm is an indicator of the depth of the mixed layer along much of the coast. Using the FNOC data, Dr. McLain has shown that the 14°C isotherm has often been deeper than normal along the coast since early 1976. This anomalous deepening of the ocean thermal structure has apparently reduced the upwelling of nutrients to the surface waters, thereby reducing the biological productivity of the region. Declines in the harvest of kelp off San Diego and reduced growth rates of coho salmon from hatcheries in Oregon may be evidence of the reduced productivity.

During the El Niño condition of last winter, the deepening of the thermal structure was extreme and the 14°C isotherm was 50 to 100 m deeper than normal all along the coast from Peru to southern California. Biological productivity along the coast was greatly reduced and as a result, many marine species such as anchovy, rockfish, and salmon as well as predator birds and mammals appear to have suffered below normal growth or reproductive success.

Intensified poleward currents in winter over the continental shelves were associated with deepening of the thermal structure along the coast. These poleward currents apparently caused poleward shifts of coastal populations. Off California, for example, many tropical species such as yellowfin tuna, barracuda, bonita and others have been caught, particularly by the sport fishery. Personnel at California Department of Fish and Game feel that some of these tropical species have established resident populations but may not be able to reproduce successfully.

The anomalous deepening of the thermal structure along the coast now appears to be relaxed from the extreme depressions observed last winter.

TIBURON LABORATORY

UNDERUTILIZED FISHERIES RESOURCES INVESTIGATIONS

Local Fisheries Development Projects Progressing

Frozen samples of ocean whitefish collected during the NOAA Ship David Starr Jordan cruise DS-83-12(171) in December were given to two local seafood brokers, who taste-tested the fish and then shipped the samples to Japan and Taiwan. Both brokers agreed that domestic sushi restaurants would be the best market, at least until availability of the fish and proper handling methods are established. They indicated that the frozen product was slightly below first-class quality. Export to Japan and Taiwan was not ruled out, however, and initial fishing and marketing trials may target these overseas markets. One fisherman has agreed to try to catch up to seven tons (a small shipping container-load) for trial shipment to the Far East. This trial will add information about seasonal distribution, catch rate, and size.

Samples of large ocean shrimp (about 40-50 shrimp per pound) and some ground-up pelagic red crab sent to Japan elicited favorable reaction. The former is usually eaten raw in sushi shops, while the carotenoid pigments of red crabs are of interest because of their potential use as a food dye as well as an aquaculture feed ingredient. Large ocean shrimp are commonly taken near Morro Bay, while red crab has been abundant for 2 years in southern California because of El Niño.

A rock crab fishery, which was started in Eureka last year with the aid of Sea Grant marine advisor Chris Toole, NOAA Corps Lt. Pat Rutten, and fishery biologist Sennen Salapare of the Tiburon Laboratory, appears to have finally achieved a firm foundation. One fisherman has been fishing steadily in Humboldt Bay for some time now, with stable catches and assured markets. Several inquiries have been received by Toole from other fishermen who are interested in entering the new fishery. Sea Grant is studying growth, migration, availability and effect on the crabs of claw removal.

FISH COMMUNITIES INVESTIGATIONS

Diet of King Salmon Affected during El Niño

The recent El Niño has dramatically affected the diet of king salmon. Fishery biologist Peter Adams, of the Predator-Prey Task, reported that juvenile rockfishes and the euphausid, Thysanoessa spinifera, which constitutes 40-50% of the king salmon diet during most years, were absent in the diet during 1983. Significantly, midwater collections with a trawl in areas where the salmon had been feeding indicated that the normally abundant juvenile rockfishes were absent, and that the euphausids, which normally

abound in the surface waters, were present only deeper. With these prey apparently unavailable, the king salmon took items not previously counted among its gut contents, including benthonic shrimps, large numbers of juvenile Pacific mackerel, and juveniles of its own species. The instances of cannibalism, together with the generally poor condition of individual fish, and the extremely low catches made by fishermen, indicate that conditions were poor for king salmon in this area during 1983.

1983 Rockfish Sampling Activities

Since 1977, the California Department of Fish and Game (CDF&G) and the Groundfish Analysis Task of the Tiburon Laboratory have been cooperating in sampling rockfish landings. During 1983, Dr. William Lenarz, Task Leader, reports that landings were sampled between Morro Bay and Crescent City. The sampling was conducted by CDF&G seasonal aids, with some assistance from NMFS employees. Funds for the program were jointly provided by CDF&G, Pacific Fishery Management Council (PFMC), the Groundfish Analysis Task, and the Southwest Region.

During 1983, samples were collected from 698 commercial landings. More than 19,000 fish were sampled from these trips. All of the sampled fish were identified to species and most were measured and sexed. Otoliths were obtained from most sampled fish for age determination. Data for special studies, such as season of spawning, were often collected in conjunction with the sampling program.

Data for about 80% of the samples have been entered into the Task's La Jolla Standard microcomputer and edited. About 90% of the otoliths from important species have been aged by NMFS and CDF&G employees. Processing of the samples should be completed in February, and the data will be used for a number of biological and fishery studies by scientists of CDF&G, NMFS and other agencies. For example, the data on widow rockfish will be used by Lenarz for an updated assessment of the widow rockfish fishery. The assessment will then be used as a basis for the report on widow rockfish by the Groundfish Management Team (GMT) to the PFMC.

Subsequent landings of rockfish are also made by the partyboat fleet. During 1983, samples were collected from 264 partyboat trips. About 5,000 fish were sampled. Processing of the samples is similar to that of commercial samples and is scheduled to be completed in June. As in the case of the commercial samples, the data serve many purposes. For example, Lenarz and other biologists associated with the GMT will use the data for an assessment of the fishery on black rockfish.

PHYSIOLOGICAL ECOLOGY INVESTIGATIONS

Analysis Completed for Preparing Striped Bass from San Joaquin

For several years, the Physiological Ecology Investigation has studied effects of chronic pollutants on the parasitism and condition of striped bass in the San Francisco Bay-Delta estuary. During this study, techniques were developed and variables selected which showed that health of striped bass from the field was linked with their parasite and pollutant burdens. In particular, low-boiling point petrochemicals occurring in tissues of prespawning striped bass are correlated with poor egg condition and reproduction and parasite lesions.

The staff of the Physiological Ecology Investigation has cooperated with the State of California's Department of Fish and Game, and State Water Resources Control Board in portions of the study, including the annual sampling of prespawning striped bass during their spawning migration through the San Joaquin-Sacramento Delta.

In 1983, the monitoring of the health and pollutant burden of striped bass was continued by members of the Bay-Delta Fisheries Project of CDF&G, after training and guidance by Dr. Jeannette Whipple, Brian Jarvis and Rahel Fischer of the Physiological Ecology Investigation. Most of the samples and data from the collection and autopsy of 36 prespawning striped bass from the San Joaquin River have now been analyzed.

Initial results show a number of differences between the current sample and those from previous years (Table 1). Water temperature and salinity at time of collection were the lowest recorded since sampling began in 1978. The lower temperature and salinity are associated with a higher outflow than in previous years; the temperature during time of collection was approximately 14.5°C, or 2° lower than the mean of previous spawning seasons (April-June).

For 1983, only petrochemical pollutants have been measured although both muscle samples for mercury and liver, and gonad and muscle samples for chlorinated hydrocarbons have been archived.

Monocyclic aromatic and alicyclic hexane hydrocarbons in fish gonads were at lower levels than in most previous years (except for 1982), but levels were higher in livers than in previous years (all years except for 1978 and 1979). The primary monocyclics found in the liver were toluene and o-xylene; the primary alicyclic hexanes were isomers of dimethyl cyclohexane. The pattern of occurrence of these hydrocarbons is "typically" observed in the chronic petrochemical pollution of the San Francisco Bay-Delta estuary. The effects of this pattern includes a higher proportion of the lower-boiling point aromatics such as benzene, toluene, ethylbenzene and m- and p-xylenes together with 1,2-dimethyl cyclohexane. The latter pattern appears associated with gasoline spills, and has a higher correlation with deleterious effects such as reduced egg condition.

TABLE 1. Comparisons among years in environmental variables, pollutant residues, inherent characteristics, and egg condition of striped bass (Morone saxatilis). Based on factor analyses of prespawning female striped bass collected from April to June; San Joaquin River. Variables listed in the table were grouped by factor analysis into a factor called YEAR. Each variable has a correlation or factor loading on YEAR $\geq$ 0.30. Variables also varied significantly among years ($P \leq 0.05$) when tested with correlation analyses. Here, the actual mean values of the variables are omitted for simplification and the years are compared by assigning ranks from highest (1) to lowest (6) mean values.

VARIABLE (N)	1978 (59)	1979 (42)	1980 (21)	1981 (12)	1982* (7)	1983* (16)
Outflow	2	5	3	4	1	1 (?)
Diversion	3	2	3	1	4	(?)
Salinity	3	1	2	3	4	4
Temperature	3	1	4	2	4	5
Metals-Gonad:						
Copper	1	NS	3	2	NM	NM
Zinc	2	NS	3	1	NM	NM
Iron	3	NS	2	1	NM	NM
Metals-Liver:						
Copper	NS	NS	2	1	NM	NM
Zinc	NS	NS	2	1	NM	NM
Iron	NM	NM	2	1	NM	NM
Petroleum Hydrocarbons-Monocyclic Aromatics:**						
Gonad	1	2	4	3	0	5
Liver	1	2	3	4	4	2
Petroleum Hydrocarbons-Alicyclic hexanes:						
Total	2	1	0	3	0	2
Color Pattern	6	3	1	4	5	2
Age	2	4	5	1	3	5
Total Parasite Severity***	5	2	4	3	1	4
Tapeworm Larvae	5	3	2	4	1	5
Tapeworm Lesions	5	1	3	2	6	4
+Egg Condition (Fewer resorbed eggs and ovaries and abnormalities, less delayed maturation).	5	4	2	3	1	2 (?)

(?) = Data analyses incomplete. NS = Not sampled. NM = Tissues sampled, but not measured; archived. 0 = No residues detected.

* Sample sizes in 1982 and 1983 were small because of reduced population size of prespawning adults. Data from 1983 recently added, incomplete.

** Ranks for monocyclics based on both mean concentrations and number of different monocyclics present. Polycyclic aromatics, thiophene in particular, were found to be highest in fish from the San Joaquin-Sacramento River delta when compared to fish from Chesapeake Bay (USF&W, 1982).

*** All types of parasites and host reactions.

Fish had fewer parasitic roundworm larvae, but still exhibited relatively high numbers of cestode larvae; 50% of the fish sampled bore one or more lesions resulting from the inflammatory response to cestode larvae. Other measures of the health of the fish and their organs indicated similar problems but parasitic damage, except for lesion damage, appeared less than in previous years.

The sample of 20 males and 16 females was generally younger than those from most other years. The mean age of the fish sampled (4.92 yrs) was equivalent to those sampled in 1980 (4.95 yrs). Females captured in 1980 and 1983 were younger (mean = 5 yrs) than those captured in other years (mean $\geq$ 5 yrs). This is probably part of the reason for their relatively good condition. Previous analyses show that overall condition in adults decreases in older females and males.

None of the females showed complete ovarian resorption from gross observations. One appeared delayed and two were immature; none was spent. Generally, females appeared somewhat delayed in egg maturation, probably due to the lower temperatures.

Resorbing eggs in ovaries of females were observed grossly. Slides of these ovaries, however, have not been completed and conclusions about the degree of egg resorption will not be made until completion of histological examination.

On the whole, autopsy data indicate that fish were healthier than those collected in previous years, particularly in 1978 and 1981, but the low adult population size as reflected by the difficulty in sampling fish, especially females, indicates a continued problem with the fishery. Few large adult females were captured during the 1983 sampling period and there appear to be fewer large adult females spawning. It is possible that larger fish migrated from offshore into the Delta to spawn later than mid-June and were missed by the sampling effort. It is recommended that this possibility be examined in years of high outflow and lower temperatures, and that the sampling period be extended.

The continued existence of low-boiling point petrochemicals in the tissues of even the younger adults also indicates a continued problem with petrochemical pollution.

This monitoring program will continue with CDF&G taking the lead in analyzing the health of bass in relation to pollutant burdens. The research will be funded by the State Water Resoures Control Board under the Aquatic Habitat Program. Dr. Bruce MacFarlane of the staff of the Physiological Ecology Investigation has presented recommendations to the committee for continued monitoring of striped bass. Further recommendations for data analyses and assessment of health in relation to the previous years are forthcoming.

The first draft of a manuscript on monitoring and autopsy techniques entitled, "Histopathological manual for monitoring striped bass in relation to pollutant burdens," by Jeannette Whipple, Marvin Jung and Rahel Fischer has been revised outside peer review.

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Preparations are being made for future groundfish planning meetings. Dr. Jeannette Whipple and other members of Physiology Ecology staff expect to participate in this planning. A literature search and review of groundfish research, management, population ecology and physiology is being completed. With the assistance of John Greeley, Editorial Assistant, computer searches are being conducted and all pertinent references are being stored in the microcomputer and on disks.

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Maxwell Eldridge discussed his doctoral research on life history tactics in striped bass with thesis committee member Jeannette Whipple, and has completed his literature review of the subject. Eldridge is preparing for oral examinations at Oregon State University this spring and has begun the write-up of his thesis after approval by committee members of a revised thesis outline.

FISHERIES INFORMATION SYSTEMS AND AUTOMATIC DATA PROCESSING

A-76 Review of Activities at Southwest Fisheries Center

The Arthur Young and Co.'s contract review of ADP activities at the SWFC began here on January 23. This review, required by OMB Circular A-76 (revised), will include ADP activities at La Jolla, Terminal Island, and Tiburon, California and Honolulu, Hawaii. The purpose of this review is to determine if any ADP function currently performed in the SWFC by government employees can be performed more cheaply by private industry. Should the contractor determine that any current ADP function can be performed by contract, private industry will be allowed to bid to perform the service. The SWFC will also compete, on a cost basis, to retain the services in-house.

This study is being conducted in three phases. Phase I, the Management Efficiency Study, is scheduled to be completed by the end of March 1984. This first phase will develop the recommendations concerning what, if any functions, could be performed by private industry. Phases II and III will follow if it is determined that private industry could provide some of the services now performed by government employees. If the recommendation is that the work is "inherently governmental," then Phases II and III will be dropped. Funds to pay for this study have been provided by NMFS.

Beginning on January 23 and continuing for most of February, the contractor is conducting interviews with SWFC personnel and with outside users to determine the scope of the Center's ADP activities. In addition to interviews with Center employees, the contractor is scheduled to talk to the staff at the Southwest Region, California Department of Fish and Game, the Hawaii Department of Aquatic Resources, University of California, San Diego, and the Pacific Coast Data Goals Committee; others may be scheduled, if necessary. About 68 interviews are currently scheduled.

Administrative staff, the Data Manager, and individuals interviewed have been requested to furnish data to the contractor's representatives to support the analysis. It is expected that the current contract will continue through mid-July 1984, if all three phases are required. The A-76 principal reviewer is Ben Remington, Executive Officer; alternate is Fred Kellenberger, Data Systems Manager.

Shipboard Requirements Committee Organized

A SWFC Shipboard Requirements Committee was organized at La Jolla, in January. The responsibilities of this committee are to assess needs and requirements for a shipboard computer and elect some accessories of all users at the Tiburon Laboratory, Pacific Environmental Group (PEG), and the La Jolla Laboratory, to formulate the parameters for input to the CAMAC (the electronics data acquisition system), to plan the maximal configuration of the shipboard Molecular supermicrocomputer system, to set priorities for purchase

of equipment, to review the application software packages needed for CAMAC data reduction, management, and analysis, to identify the unit responsible for developing the software, and to set priorities for development of software. Before any recommendations by the committee are submitted to the Center Director, the committee will meet with shipboard users at a general meeting to inform them of the recommended actions and solicit additional input. With the approval of the Division Chiefs and the Data Systems Manager, the six members of the committee are Al Coan and Wes Parks (OFRD), Rich Charter and Ron Lynn (CFRD), Susan Iacometti and Dorothy Roll (ADP). Jack Brown, Electronics Engineer, will be consultant to the committee and Mrs. Roll the chairperson.

During the week of January 3, Mike Webb, Electronics Engineer in the National Ocean Service (NOS), Pacific Marine Center, Seattle, Washington, was in the La Jolla Laboratory to implement the new version of the CAMAC data collection system on the NOAA Ship David Starr Jordan and to interface the CAMAC with the ship's Molecular super-microcomputer. On January 4 and 6, key users of the shipboard data collection system met with Webb to acquaint him with requirements for shipboard data collection of Center Laboratories. In order to assist the users in defining their parameters, Webb explained how the sensors constitute input to the CAMAC, how information is processed in the CAMAC, and the expected output to the shipboard Molecular super-microcomputer 15-8.

Based on Webb's information, the Shipboard Requirements Committee drafted a specifications list for the input to the CAMAC from the existing, planned and desired sensors. The specifications list and questions on target dates for implementation have been sent to Webb for his review.

Other ADP Activities

Financial Reporting System Ready For Test

Robert Nydam, Computer Programmer Analyst, Robert Bistodeau, Computer Technician, and Dorothy Roll, Computer Systems Analyst, met with Ben Remington, Executive Officer, and Lorna Marquez, Accounting Technician, on January 12, to discuss the progress of the Financial Reporting System (FRS) to be implemented on the Molecular super-microcomputer 32X. The data entry programs will be ready for test input by Marquez the first week of February. Three of the eight summary reports will be produced on the February month-end data. A priority level has been placed on the target date for the implementation of the remaining five summary reports. A site visit to one of the field laboratories by Ben Remington and Bob Nydam is planned for late February. During this visit, an on-hands training will be conducted on the use of the FRS on-line entry and reporting system.

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Susan Iacometti, Computer Systems Programmer, assisted Nancy LaRoche, Secretary to the Deputy Director, and Julie Shoemaker, Secretary to the

Leader, Coastal Division, to adapt the new versions of WordStar for use with the NEC letter quality printers. The minutes of the Center Staff meeting by Lillian Vlymen are now being written using the WordStar system.

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Dorothy Roll and Rich Charter, Computer Specialist, continue to develop the CalCOFI Data System. Roll has completed the data description for all the elements on the CalCOFI data collection forms and has begun the description for the elements in the data base files. Ron Whyte and Doug Hammond, Data Editors, have entered and edited the data from the fish larvae and egg identification sheets for 1966 through 1969. The header information for the 1960 through 1965 larvae and egg identification data series have been transferred from VAX to the La Jolla Standard microcomputer's diskettes. The editors are currently entering the data for those years.

Search for Software Programs Underway

Fred Plotkin, NOAA Corps Officer stationed at the Tiburon Laboratory, has been assigned the task of finding, installing, and becoming familiar with various vendor software. He has worked on dBASEII, WordStar, CALCSTAR, DATASTAR, FORTRAN (80) and CBASIC. As he completes the preliminary investigation of each package, he will be giving a presentation to the Tiburon Local Users Group (TLUG) and interested staff on the package and applications, with a working example. The first presentation on DATASTAR is scheduled for the second week in February. After each presentation Plotkin will assume the role of consultant and "bug chaser" but will not create any finished, production programs. He has been helped by Bob Nydam, Computer Programmer, who has indicated that new versions of WordStar, SPELSTAR, MAILMERGE, ANSI 77 FORTRAN, dBASEII (2.4), SUPERCALC, and STATPIK will be reviewed for the Tiburon Laboratory.

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Susan Iacometti, with the assistance of Christina Show, Computer Programmer Analyst in OFRD, operated the Intrepretive Structural Modeling (ISM) and Trade-off Analysis sessions for the Albacore Workshop on January 18 and 19.

MISCELLANEOUS

PUBLIC AFFAIRS

La Jolla Laboratory

Dr. Al Myrick was a busy and popular lecturer during the month. On January 9, 1984, he spoke to two consecutive biology classes, grades 11 and 12, at University City High School on, "Form and function in whales and dolphins."

On January 20, 1984, he spoke to three consecutive classes in biology and marine science (grades 11 and 12) at Madison High School in San Diego on "Marine mammals of the Pacific" and on "Evolution of whales."

On January 23, 1984, he repeated his lecture on "Form and function in whales and dolphins," to biology classes (grades 10, 11, and 12) at Madison High School.

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Biologist Larry Hansen presented a lecture on bottlenose dolphins to a general meeting of the Orange County Chapter of the American Cetacean Society on January 26.

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For the second consecutive year, Dr. Nevin Grossnickle, Assistant Professor at Grand Canyon College, Phoenix, Arizona, brought his oceanography class of 18 students to the Center for lectures by Oceanographer Dr. Michael Laurs and Meteorologist Forrest Miller on the effects of the El Niño on January 13.

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Harold Doerr and 9th grade students from Samuel Gompers Magnet School in San Diego were at the Center January 13 for a lecture and tour of the experimental salt-water aquarium by fishery biologist Roderick Leong.

SEMINARS

La Jolla Laboratory

January 24 - Dr. Jo Hunsaker, Associate Professor of Business Administration, University of San Diego, discussed "Men and Women: Work, power and politics." This lecture was sponsored by the Federal Women's Program Committee at the La Jolla Laboratory.

VISITORS

Honolulu Laboratory

January 5 - Beatrice Burch of the Bernice P. Bishop Museum visited Richard Shomura to discuss the status of the transfer of the Honolulu Laboratory invertebrate collection to the Museum.

11 - Richard H. Hagemeyer, Director, National Weather Service, Pacific Region, discussed the "Year of the Oceans" with Richard Shomura.

- Robert T.B. Iversen, former Fishery Attache, Tokyo, Japan and Dr. John Gissberg, newly appointed Fishery Attache, visited Richard Shomura.

- Craig S. Harrison, Environment and Policy Institute, East-West Center, and Michael Seki discussed with Richard Shomura a chapter on seabirds they are preparing for inclusion in a book.

- Dr. Christofer Boggs and Dr. Brill discussed tuna research with Richard Shomura.

18 - Dr. Juro Yamada, Dr. Kazunori Takano, and Dr. Motohiro Shomizu, all of the Faculty of Fisheries, Hokkaido University, Hakodate, and Muneharu Kusakari, Hokkaido Institute of Mariculture, visited Dr. Boehlert to discuss cooperative research on U.S. and Japanese species of Sebastes; they also visited Acting Laboratory Director Uchida.

25 - Dr. Richard Brock, University of Hawaii, met with Richard Shomura and James Uchiyama.

- Tom Minello, Galveston Laboratory, Southeast Fisheries Center, paid a courtesy call on Richard Shomura.

La Jolla Laboratory

January 23 - Joyce Wood, NOAA Office of Plans and Policy, Washington, DC, visited the Center.

23-25 - Howard Fraley and Carolyn Riley-Payne, WASC Area Personnel Representatives, at the Center to attend A-76 meetings.

30 - Honorable Rupa Karunatilaka, Minister for Galle District and Member of Parliament, Democratic Socialist Republic of Sri Lanka and Donald Y. McCoy, Escort, McCoy and Associates, Great Falls, Virginia.

Pacific Environmental Group

January 6 - Phil Roedel, Resources Development Associates, and Jim Johnson, Global Weather Dynamics, discussed environmental techniques developed at PEG for possible application to fishery development matters in the Arabian Sea region.

11 - Ed Melvin, University of California Extension (Sea Grant Marine Advisor for Monterey and Santa Cruz Counties) discussed PEG environmental index products.

Tiburon Laboratory

January 6 - Terry Johnson of National Fisherman Magazine interviewed Sus Kato.

11 - Ann Blackwell, Wayne M. Getz, and Charles Blackwell, from the University of California/Berkeley, met with Bill Lenarz to discuss a possible cooperative study on modeling of groundfish fisheries.

16 - Dan Strombon, NMFS Development Division, Terminal Island, California visited the Center.

- Congresswoman Barbara Boxer, in whose district the Tiburon Laboratory is located, met with Norm Abramson, Sus Kato, Bill Lenarz, and Jeannette Whipple. Each of the Tiburon staff gave a brief presentation on the function of his or her unit. Mrs. Boxer evinced a keen interest in the Laboratory and its activities.

20 - Joyce Wood, NOAA, Policy and Planning, Washington, DC, met with Jeannette Whipple to discuss environmental research done by the Physiological Ecology Investigation.

- Michael Kahoe, State Office of Planning and Development, Sacramento, California, met with Ed Ueber to discuss how fisheries matters are affected by coastal planning, offshore drilling, and marine mineral development.

MEETINGS AND TRAVEL

Honolulu Laboratory

January 11-21 - Richard S. Shomura traveled to (1) Seattle, Washington, for discussions with Northwest and Alaska Fisheries Center and Pacific Marine Center, National Ocean Service officials on the net entanglement workshop and Townsend Cromwell matters, and (2) La Jolla, California, to participate in the SWFC albacore workshop and the tuna meeting convened by Dr. James Joseph of the Inter-American Tropical Tuna Commission.

20-27 - Dr. George W. Boehlert traveled to New Orleans, Louisiana, to present a paper at the AGU-ASLO Ocean Sciences Meeting and to attend the Alvin submersible planning meeting, and to Newport, Oregon, to conduct cooperative research on Sebastes at the Cooperative Institute for Marine Resources Studies, Oregon State University.

26-27 - Richard Shomura participated in the meetings of the SSC at the Ala Moana Hotel.

January 30-
February 1 - Richard Shomura attended the Council meeting at the Ala Moana Hotel.

La Jolla Laboratory

January 3-6 - Data Systems Manager Fred Kellenberger was in Honolulu, Hawaii, to discuss FIN, ADP, and A-76 activities.

6 - Dr. Barrett, Dr. Reuben Lasker, and Mr. John Carr attended a CalCOFI meeting at the Center.

8-30 - Ron Dotson, Fishery Biologist, traveled to Horta, Azores Island, Portugal, and to Rome, Italy, to confer with the Minister of Fisheries for the Azores concerning tuna fishery development, inspect fishing vessels and equipment, and define objectives of upcoming development project. In Rome, Dotson conferred with FAO staff and assisted in ordering fishing equipment.

January 8-March 8 - Dr. Ron Rinaldo is in Washington, DC, to obtain experience in operation and management at the NMFS headquarters.

January 9-10 - Dr. Gary Sakagawa was in Denver, Colorado, to attend planning meeting of U.S. research for the annual meeting of ICCAT.

9-11 - Planning Officer David Mackett traveled to Seattle, Washington, and to Portland, Oregon, to discuss groundfish planning with staff at the Northwest Region and Center and with attendees of the Pacific Fishery Management Council in Portland, Oregon.

- Drs. Izadore Barrett and Dan Huppert were in Portland, Oregon, to attend the Pacific Council's Scientific and Statistical Committee meeting.

15-18 - Mr. Carr was in Seattle, Washington, to participate in the 1984 Marine Command Seminar of the Pacific Marine Center, NOS, Seattle, Washington.

18-19 - Workshop on Strategic Planning for the NMFS Program for North Pacific Albacore Research and Management held at Center.

Workshop on Strategic Planning for the NMFS Program for North Pacific Albacore Research Held at SWFC

Headed by Assistant Administrator for Fisheries, William Gordon, a blue-ribbon group of participants from NMFS, Washington, DC, the Northwest and Alaska Fisheries Center, Northwest Region, and the Southwest Region and Center met at the Southwest Fisheries Center in La Jolla, California, January 18-19, to consider and select the strategic options that will guide the planning and further development of the Service's albacore research and management program.

The options were developed from the futures-oriented deliberations of a constituent group meeting at the Southwest Fisheries Center in June 1983 and from analyses conducted by a task force of scientists and managers from the Southwest Region and Center. The options were arrayed for the participants

into 14 separate categories, each of which represented a dimension thought necessary for the design of a comprehensive program (e.g., Fishery Development, Fishery Management, New Product Development, Product Quality, Financial Assistance, Data Systems, Research, etc. Participants then discussed the options within each category and selected those most appropriate for guiding the NMFS program.

The options encompassed the entire spectrum of important considerations from citizen participation in planning and operations through continuance of the present level of data collection to the establishment, if ultimately required, of a new international framework for management of the Pacific albacore fisheries.

The report of the meeting and the NMFS Strategic Plan for the albacore program will be available within 3 weeks.

Shown in photograph above are participants in the albacore meeting. In foreground is Mr. David Mackett with Dr. Alexander Christakis, Director, Center for Interactive Management and facilitator at the board.

Counterclockwise around the table, beginning with Mr. Mackett's left are: Dr. William Aron, Director, Northwest and Alaska Fisheries Center, NMFS, NOAA, Seattle, Washington; Mr. John Everett, Chief, Office of Policy and Planning, NMFS, NOAA, Washington, DC; Dr. Izadore Barrett, Director, Southwest Fisheries Center, NMFS, NOAA, La Jolla, California; Mr. Robert J. Ayers, Deputy Chief, Fisheries Management Division, Northwest Regional Office, NMFS, NOAA, Seattle, Washington; Mr. Richard Shomura, Director, Honolulu Laboratory, SWFC, NMFS, NOAA, Honolulu, Hawaii; Mr. William G. Gordon, Assistant Administrator for Fisheries, NMFS, NOAA, Washington, DC; Dr. Reuben Lasker, Chief, Coastal Fisheries Resources Division, SWFC, NMFS, NOAA, La Jolla, California; Mr. J. Gary Smith, Deputy Regional Director, Southwest Regional Office, NMFS, NOAA, Terminal Island, California; Mr. Roland A. Finch, Director, Office of Fisheries Management, NMFS, NOAA, Washington, DC; Dr. Joseph W. Angelovic, Assistant Administrator for Science and Technology, NMFS, NOAA, Washington, DC; and Dr. Gary Sakagawa, Chief, Oceanic Fisheries Resources Division, SWFC, NMFS, NOAA, La Jolla, California.

January 19-23 - Jeannie Wexler traveled to San Clemente Island to perform counts, tag resights and scat collections on sea lions.

22-27 - Dr. Paul Fiedler traveled to New Orleans, Louisiana, to make a presentation at the American Geophysical Union Ocean Sciences Meeting.

22-28 - Dr. Robert Owen traveled to New Orleans, Louisiana, to make a presentation at the American Geophysical Union-American Society of Limnology and Oceanography.

23 - Meeting on A-76 held at Center (see submission in Fisheries Information Systems and Automatic Data Processing Section this monthly report).

23-25 - Dr. Izadore Barrett traveled to Washington, DC, to attend a DDI Conference on decisions for the NMFS FY 1986 budget.

23-27 - David Holts traveled to Long Beach, California, to board the research vessel, Kelpbass and go to sea to observe gill net dynamics and catch.

24-29 - Dr. Richard Methot traveled to New Orleans, Louisiana, to present the results of anchovy research at the American Society of Limnology and Oceanography meeting.

27 - Drs. Reuben Lasker and Dr. Izadore Barrett attended a Sea Grant Electrophoresis Workshop at SIO.

31 - Izadore Barrett traveled to Sacramento, California, to attend 1984 Fisherman's Forum.

January 31-February 2 - Benjamin Remington traveled to Seattle, Washington, to discuss administrative/personnel matters with WASC staff.

January 31-February 3 - Michael Laurs traveled to Honolulu, Hawaii, to make a presentation at the Western Fishboat Owners Association district meeting.

January 31-February 3 - Doug DeMaster traveled to Vancouver, BC, to participate in a computer assessment modeling workshop.

Pacific Environmental Group

January 5 - Dr. Richard Parrish traveled to La Jolla, California, to attend a sardine workshop at the SWFC.

17 - Dr. Richard Parrish traveled to La Jolla, California, to attend a Strategic Planning Meeting for Albacore.

23-27 - Andrew Bakun and David Husby attended the AGU/ASLO/AMS/MTS Ocean Sciences Meeting in New Orleans, Louisiana. Bakun chaired a special session on Environment and Year Class Fluctuations. They presented papers entitled: "On the relation between vertical stability and spawning of pelagic fishes in Eastern Boundry Current Region" (Husby) and "Comparative studies: Offshore transport and spawning habitat of the Peruvian anchoveta" (Bakun).

- Rosemary Troian traveled to WASC in Seattle, Washington, to meet with various personnel on the topics of finance, travel, procurement and personnel.

Tiburon Laboratory

January 11-12 - Norman Abramson attended the meeting of the Pacific Fishery Management Council in Portland, Oregon.

12 - Sus Kato and Sennen Salapare traveled to Morro Bay, California, to deliver octopus samples to a cephalopod researcher for confirmation of identification, and to collect samples of ocean shrimp and pelagic red crabs provided by a fisherman.

31 - Norman Abramson, Sus Kato, and Ed Ueber attended the 12th Annual Legislative Fisheries Forum at the State Capital in Sacramento, California.

PERSONNEL

Honolulu Laboratory

January 7 - James C. Cooper, Computer Assistant - Resignation.

- Martina K.K. Queenth, Biological Laboratory Technician (Fisheries) - Resignation.

12 - Louise F. Lembeck, Editorial Clerk - Full-Time, Temporary Appointment.

17 - Mark D. Ow, Computer Assistant - Resignation.

- Happy A. Williams, Biological Aid (Microbiology) - Conversion to Excepted Temporary Appointment.

22 - Alan R. Everson, Biological Technician (Fisheries) - Full-Time Temporary Appointment.

- Thea C. Johanos, Wildlife Biologist - Conversion to Temporary Appointment.

- Gail A. Peiterson, Biological Technician (Wildlife) - Conversion to Temporary Appointment.

24 - Amy F. Nishimura, Computer Programmer - Conversion to Temporary Appointment.

La Jolla Laboratory

January 1 - James W. Gilpatrick, Biological Technician - Place in Pay Status.

3 - Peggy Cheng, Computer Assistant - Extension of Temporary Appointment, NTE 4-1-84.

5 - Michael Spruth, Electronic Technician - Entered on Duty.

- Drew Stanley, Biological Laboratory Technician - Extension of Temporary Appointment.

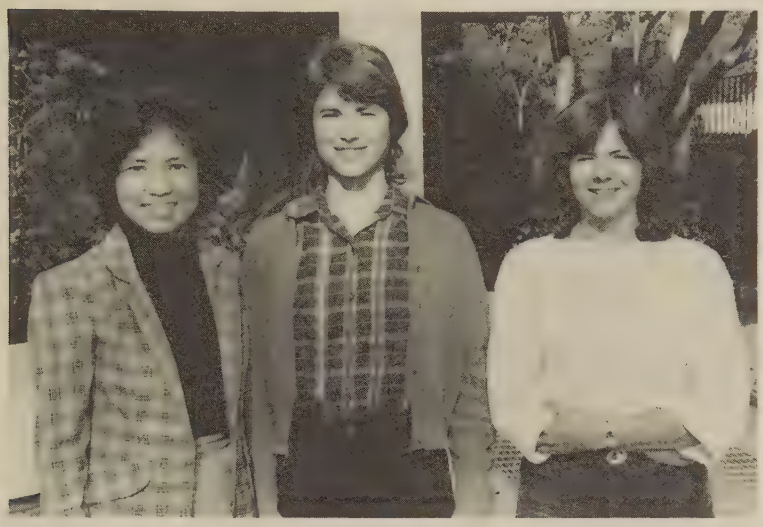
10 - Raul Rivera, Biological Aid - Termination.

- Kelvin Carlson, Economist - Extension of Appointment.

22 - Susan Richardson, Clerk-Typist - Entered on Duty, Part-Time Temporary Appointment.

23 - Anita Holmsen, Biological Aid - Entered on Duty, Part-Time Temporary Appointment.

31 - John Cologne, Statistician - Extension of Part-Time Temporary Appointment.



Members of the 1984 Federal Women's Program Committee at the La Jolla Laboratory. From left: Nancy Lo, Sandy Hawes, and Aleta Hohn.

New members of the 1984 EEO Committee at the La Jolla Laboratory pose after selection. From left: Nelson Ross of NOAA's EDIS/NODC, Chairperson Susan Iacometti, Nancy Lo, Gail Theilacker and Sam Herrick.

Tiburon Laboratory

January 9 - Norma Smith, Clerk-Typist - Part-Time Temporary Appointment.

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